

IEEE-NANO 2003 Technical Program

Tuesday 12 August 2003

Tuesday 8:45–9:50

Opening and Plenary Session

Session Chairs: Meyya Meyyappan, NASA Ames Research Center & Chennupati Jagadish, Australian National University

Plenary Talk 1 – Molecular Electronics: Vision and Status

Speaker: R. Stanley (Stan) Williams, Hewlett Packard

9:00-9:50 Tuesday

Room 134

Tuesday 10 00–12:15

TA: Molecular Electronics I

Session Chair: Dwight Woolard, Army Research Office

10:00-12:15 Tuesday

Room 134

TA 1: Molecular Electronics: High Yield Process for Metal-Molecule-Evaporated Metal Junctions on Microfabricated Chips (Invited)

Glenn H. Martin, Menno R. de Jong and Mark Reed

TA 2: Device Simulation at the Scaling Limit and Beyond (Invited)

Mark Lundstrom

TA 3: Influence of External Electric Fields on Electronic Response and Bandstructure of Carbon Nanotubes

Yan Li, Slava V. Rotkin and Umberto Ravaioli

TA 4: Room Temperature Negative Differential Resistance Measured Through Individual Molecules on Silicon

Nathan P. Guisinger, Rajiv Basu, Andrew S. Baluch and Mark C. Hersam

TA 5: Molecular Quantum-Dot Cellular Automata

Beth Isaksen and Craig S. Lent

TB: Spintronics and Nanomagnetism I

Session Chair: Herb Bennett, NIST

10:00-10:30 Tuesday

Room 133

TB 1: Nano Processing for GMR Magnetic Recording Heads - A Spintronics Device Structure (Invited)

J. A. Katine, S. MacDonald, M. -C. Cyrille, A. Driskill-Smith, D. Druist, R. Tiberio and Robert E. Fontana

TB: Spintronics and Nanomagnetism I

Session Chair: Supriyo Bandyopadhyay, Virginia Commonwealth University

11:00-12:15 Tuesday

Room 133

TB 2: Nucleation, Growth, Electronic and Magnetic Properties of Epitaxial Co-doped TiO₂Anatase (Invited)

Scott A. Chambers

TB 3: Characterization of Ferromagnetic Co-Implanted Rutile TiO₂ (110)

V. Shutthanandan, S. Thevuthasan, M. H. Engelhard, T. Droubay, S. M. Heald, L. V. Saraf, S.A. Chambers, B. Taylor, R.P. Sears, B.Sinkovic and B.S. Mun

TB 4: Ferromagnetism in Mn- and Co- Implanted ZnO Nanorods

K. Ip, R.M. Frazier, Y.W. Heo, D.P. Norton, C.R. Abernathy, S.J. Pearton, J.M. Zavada, R.G. Wilson, J. Kelly, R. Rairigh and A.F. Hebard

TB 5: Investigation of Antiferromagnetic Ordering Along Chains of Coupled Nanomagnets

A. Imre, G. Csaba, G. H. Bernstein, W. Porod and V. Metlushko

TC: Modeling and Simulation I: Nanoelectronics

Session Chair: Narayan Aluru, University of Illinois, Urbana-Champaign

10:00-12:15 Tuesday

Room 132

TC 1: Simulation of Nanostructures (Invited)

Karl Hess

TC 2: Modeling the Enhancement of Nanoscale MOSFETs by Embedding Carbon Nanotubes in the Channel

Akin Akturk, Gary Pennington and Neil Goldsman

TC 3: Quantum Mechanical Modeling of Advanced Sub-10nm MOSFETs

Thomas J. Walls, Viktor A. Sverdlov and Konstantin K. Likharev

TC 4: Scattering in a Nano-Scale MOSFET; A Quantum Transport Analysis

Wanqiang Chen, Leonard F. Register and Sanjay K. Banerjee

TC 5: Comparison of Quantum Correction Models for Ultrathin Oxide Single- and Double-Gate MOS Structures Under the Inversion Conditions

Yiming Li, Shao-Ming Yu, Chien-Shao Tang and Teng-Sheng Chao

TC 6: Multidimensional Nanoscale Device Modeling: The Finite Element Method Applied to The Non-Equilibrium Green's Function Formalism

Eric Polizzi and Supriyo Datta

TD: Inorganic Nanowires, Nanocrystals and Quantum Dots I

Session Chair: Richard Noetzel, Eindhoven University of Technology

10:00-12:15 Tuesday

Room 131

TD 1: Semiconducting Oxide Nanobelts – Structures, Properties and Nanodevices (Invited)

Zhong Lin Wang

TD 2: Gas Sensing Properties of Single-Crystalline Indium Oxide Nanowires (Invited)

Daihua Zhang, Chao Li, Xiaolei Liu, Song Han, Tao Tang and Chongwu Zhou

TD 3: Epitaxial Single Crystalline Inorganic Nanowires and Nanowalls: Growth Morphogenesis and Applications in Nanoelectronics

Pho Nguyen, Jing Kong, Jun Li, Alan Cassell, Richard Quinn, Jie Han, Meyya Meyyappan and Hou T. Ng

TD 4: Rectifying Effect in Boron Nanowire Devices
Dawei Wang, Carolyn Jones Otten, William E. Buhro and Jia G. Lu

TD 5: Quantum Size Effects in Nanoscale Metallic Structures
Dongmin Chen and Toshishige Yamada

TE: Nanorobotics: Manufacturing and Reliability I
Session Chair: Metin Sitti, Carnegie Mellon University
10:00-12:15 Tuesday
Room 130

TE 1: Nanomanufacturing (Invited)
Charalabos C. Doumanidis

TE 2: Manufacturing of Two and Three-Dimensional Micro/Nanostructures by Integrating Optical Tweezers with Chemical Assembly
Kenneth Castelino, Srinath Satyanarayana and Metin Sitti

TE 3: 3-D Nano-Fiber Manufacturing by Controlled Pulling of Liquid Polymers Using Nano-Probes
Amrinder S. Nain and Metin Sitti

TE 4: Augmented Reality System for Real-time Nanomanipulation
Guangyong Li, Ning Xi, Mengmeng Yu and Wai Keung Fung

TE 5: Manipulating Nano Scale Biological Specimen in Liquid
Guangyong Li, Ning Xi, Mengmeng Yu, Fathi Salem, Donna H. Wang and Jianping Li

TE 6: Massively Parallel Scanning Probe Nanolithography
Daniel J. Arbuckle and Aristides A. G. Requicha

Tuesday 1:30–3:00

TF: Molecular Electronics II
Session Chair: Hong-Liang Cui, Stevens Institute of Technology
1:30-3:00 Tuesday
Room 134

TF 1: A Theory-Guided Approach to Molecular Electronics: Analysis, Design and Simulation (Invited)
Jorge Seminario

TF 2: The Role of the Electron-Phonon Scattering on the Electronic Transport in Organic Nanostructures
Marieta Gheorghe, Luca Latessa, Aldo di Carlo, Paolo Lugli and Alessandro Pecchia

TF 3: A Conformational Molecular Switch
Ranjit Pati and Shashi P. Karna

TF 4: Toward Molecular Memory Chips
Chao Li, Daihua Zhang, Song Han, Tao Tang, Chongwu Zhou, Wendy Fan, Jessica Koehne, Jie Han, Meyya Meyyappan, A. M. Rawlett, D. W. Price, James M. Tour and Xiaolei Liu

TF 5: Electronic Conduction in DNA Attached to Gold Electrodes
Sugata Bhattacharya, Jaewon Choi, Alejandro F. Bonilla, Kyung Jae Jeong, Saurabh Lodha, David B. Janes and Gil U. Lee

TG: Spintronics and Nanomagnetism II
Session Chair: Marc Cahay, University of Cincinnati
1:30-3:00 Tuesday
Room 133

- TG 1:** Artificial Atoms and Molecules for Spintronic Applications (Invited)
Jean-Pierre Leburton
- TG 2:** Spin Transport in Nanowires
Sandipan Pramanik, Supriyo Bandyopadhyay and Marc Cahay
- TG 3:** Simulation of Spin-Polarized Transport in Submicrometer Device Structures
Semion Saikin, Min Shen, Ming -C. Cheng and Vladimir Privman
- TG 4:** 3-D Self-Consistent Simulation of Spin-Qubit Quantum Dot Circuit with Integrated Read-out
Lingxiao Zhang, P. Matagne, R. Hanson, L. P. Kouwenhoven and J. -P. Leburton
- TG 5:** Electronic Structure of Vertically Coupled Multilayers Semiconductor Quantum Dots in a Magnetic Field
Yiming Li and Hsiao-Mei Lu

TJ: Modeling and Simulation II: Applications
Session Chair: Karl Hess, University of Illinois, Urbana-Champaign

1:30-3:00 Tuesday
Room 132

- TJ 1:** Molecular Dynamics Predictions for Chemical Modification of “Nanopeapods” Via Ion Beam Deposition
Yanhong Hu, Douglas Irving and Susan Sinnott
- TJ 12:** A Computational Study of Gas Phase Chemistry in Carbon Nanotube Synthesis by PECVD
R. K. Garg, J. P. Gore, T. S. Fisher, D. Hash and M. Meyyappan
- TJ 3:** Electronic Structure of Nanometer-Scale Semiconductor Wires
M. P. Persson and H. Q. Xu
- TJ 4:** Quantum Evolution of Charge and Phase on a Capacitor in a Dissipative Nanoscale Circuit
W. H. Richardson
- TJ 5:** Realistic Single-Electron Transistor Modeling and Novel CMOS/SET Hybrid Circuits
Ki-Whan Song, Gwanghyeon Baek, Sang-Hoon Lee, Dae Hwan Kim, Kyung Rok Kim, Dong-Soo Woo, Jae Sung Sim, Jong Duk Lee and Byung-Gook Park
- TJ 6:** Effects of Nano-Particle Filler on the Fracture Behaviour of Bulk-Epoxy in Experiment and Simulation
Jürgen Keller, Dietmar Vogel, Olaf Wittler, Hans Walter, Bernhard Wunderle, Bernd Michel

TK: Inorganic Nanowires, Nanocrystals and Quantum Dots II
Session Chair: Joachim Wolter, Eindhoven University of Technology
1:30-3:00 Tuesday
Room 131

- TK 1:** Coherence and Dephasing in Self-Assembled Quantum Dots (Invited)
J. Hvam, K. Leosson and D. Birkedal
- TK 2:** Electrorrefraction in Quantum Dots: Dependence on Lateral Size and Shape
R. Prasanth, J.E.M.Haverkort and J.H.Wolter
- TK 3:** A Grazing Incidence Small Angle X-ray Scattering Study of the Effect of Growth Interrupt on the Structure of InAs Quantum Dots

Paul Howes, Mohamed Henini, Jonathan L Rawle, Amalia Patane, Mark J. Everard, Fabio Pulizzi and Stephen H. Baker

TK 4: InAs Quantum Dot and Nanowhisker Formation by Metalorganic Chemical Vapor Deposition in Porous Materials

Terence S. Yeoh, R. B. Swint, V.C. Elarde, J. J. Coleman, T. L. Rittenhouse and P. W. Bohn

TK 5: Optical and Structural Properties of InP Nanowires Grown Under Vapor-Liquid-Solid Mechanism by Metal Organic Vapor Phase Epitaxy

Satyaban Bhunia, T. Kawamura, Y. Watanabe, S. Fujikawa and K. Tokushima

TL: Nanorobotics: Manufacturing and Reliability II
Session Chair: Metin Sitti, Carnegie Mellon University

1:30-3:00 Tuesday

Room 130

TL 1: Viral Protein Linear (VPL) Nano-Actuators

A. Dubey, C. Mavroidis, A. Thornton, K. Nikitzuk and M. L. Yarmush

TL 2: Length Control of Carbon Nanotubes through Nanorobotic Manipulations

Lixin Dong, Fumihito Arai and Toshio Fukuda

TL 3: Cooling Strategies for High Performance Miniature Wireless Robots Designed to Operate at the Nanoscale

Sylvain Martel

TL 4: Electromechanics of BN Nanotubes and Nanostructures with In-Situ TEM Manipulation

Jianguo Wen, Min-Feng Yu and Abhijit Prabhakar Suryavanshi

TL 5: KL Probes for Robotic-Based Cellular Nano Surgery

King W. C. Lai, Charlotte C.H. Kwong and Wen K. Li

TL 6: Measurements of the Bi-linear Elasticity of Identical Carbon Nanotubes

Masahiro Nakajima, Fumihito Arai, Lixin Dong and Toshio Fukuda

Tuesday 3:30-5:00

TM: Molecular Electronics III

Session Chair: Hong-Liang Cui, Stevens Institute of Technology

3:30-4:30 Tuesday

Room 134

TM 1: Integrating Nanoscale Semiconductor Structures with Biological Structures (Invited)

Mitra Dutta and Michael A. Stroscio

TM 2: New Nano-Electronic Memory Using Multi-Level Logic Principle

Jayanta Choudhury, G.H. Massiha and G. S. Seetharaman

TM 3: Conduction Through Molecule-Gold Cluster Complexes and Application

Jaewon Choi, D. B. Janes, S. Lodha, Y. Chen, R. Agarwal, R. P. Andres, S. Burns and C. P. Kubiak

TN: Spintronics and Nanomagnetism III

Session Chair: Vladimir Privman, Clarkson University

3:30-5:00 Tuesday

Room 133

TN 1: Propagation of Spin-Polarized Electrons Through Interfaces Separating Differently Doped Semiconductor Regions

Yuriy V. Pershin and Vladimir Privman

TN 2: Effect of Impurities in the Channel of a Spin Field Effect Transistor (SPINFET)

Marc Cahay and Supriyo Bandyopadhyay

TN 3: On-chip Detection of The Hybridisation of Cystic Fibrosis Related DNA Sequences Using Spin Valve Sensors and Nanometer-Sized Magnetic Labels

Hugo A. Ferreira, Luka A. Clarke, Margarida D. Amaral, Paulo P. Freitas and Daniel Leonard Graham

TN 4: High-density Arrays of Magnetic Ring Elements

U. Welp, V. V. Vlasko-Vlasov, G. Crabtree, M. Grimsditch, V. Novosad, J. Hiller, N. Zaluzec, B. Ilic, Xiaobin Zhu, P. Grütter, G. Csaba, A. Imre, G. Bernstein, W. Porod, J. Bekaert, V. Moshchalkov, Y. Bruynseraede and Vitali Metlushko

TN 5: Cavity-enhanced Kerr Effect For Magneto-Optic Spectroscopy of Nanostructures

Naser Qureshi, Holger Schmidt and Aaron Hawkins

TN 6: Ferromagnetic Resonance Curves of Fe/Cr(100) Ultra Thin Quasiperiodic Films

C. G. Bezerra, P. W. Mauriz and E. L. Albuquerque

TP: Modeling and Simulation III: Nanobio and NEMS

Session Chair: Susan Sinnott, University of Florida

3:30-5:00 Tuesday

Room 132

TP 1: Molecular Combinatory Computing for Nanostructure Synthesis and Control

Bruce MacLennan

TP 2: Entropy Analysis of Brownian Motor

Marina Alexandra Lyshevski

TP 3: Towards an MD Simulation Of Ion Currents in the Alpha Hemolysin Channel

Ioana Cozmuta, James O'Keefe and Viktor Stolc

TP 4: A Combined Atomistic/Continuum Analysis of Nanoelectromechanical Systems

Zhi Tang and N. R. Aluru

TP 5: Electro-mechanical Response of Carbon Nanotubes Deformed by an AFM Tip

Amitesh Maiti, M. P. Anantram and Alexei Svizhenko

TP 6: Technical Nanosystems Based on the Biological Solutions

Slawomir Nowak

TQ: Inorganic Nanowires, Nanocrystals and Quantum Dots III

Session Chair: Joachim Wolter, Eindhoven University of Technology

3:30-5:00 Tuesday

Room 131

TQ 1: New Ultra-Precise Semiconductor and Metal Nanostructures: Tubes, Shells and Their Ordered Arrays

(Invited)

V. Ya. Prinz

TQ 2: Synthesis of InN Nanowires Using a Two-Zone Chemical Vapor Deposition Approach

Tao Tang, Song Han, Wu Jin, Xiaolei Liu, Chao Li, Daihua Zhang and Chongwu Zhou

TQ 3: Characterization of Heat Transfer Along Si Nanowire

James Christofferson, Ali Shakouri, Deyu Li, Arun Majumdar, Peidong Yang and Yan Zhang

TQ 4: Engineering Densely Packed Arrays of Rare Earth Silicide Nanowires on Si(001)

Regina Ragan, Yong Chen, Douglas A. A. Ohlberg, Jianhua Yang, Y. Austin Chang and R. Stanley Williams

TQ 5: Low-temperature Growth of ZnO Polygon Prismatic Nanocrystals by Thermal Vapor Transport

SanYuan Chen, SyhYuh Cheng, ChinChing Lin

TR: Systems Integration
Session Chair: Sergey Lyshevski, RIT
3:30-5:00 Tuesday
Room 130

TR 1: Three Dimensional Polymer MEMS With Functionalized Carbon Nanotubes and Modified Organic Electronics (Invited)

Vijay K. Varadan

TR 2: Integration of MEMS and Nano: How Small Can Smart Dust Get? (Invited)

Kristopher Pister

TR 3: Biomimetics, Nanobioinformatics and Nanotechnology

Marina Alexandra Lyshevski

TR 4: Nanostructured Origami

Stanley Jurga, Carlos H. Hidrovo, Johnathan Niemczura, Henry I. Smith and George Barbastathis

Tuesday 5:00-6:15

Government Panel Discussion on Future of Nanotechnology
Session Chair & Panel Moderator: Clifford Lau, OSD-ATL & IEEE Nanotechnology Council President-Elect

Panelists: Chagaan Baata, Office of Naval Research

Tomoe Kiyosada, AIST, Japan

Anantha Krishnan, DARPA

Ray Mariella, Lawrence Livermore National Laboratory

Meyya Meyyappan, NASA Ames Research Center

Dwight Woolard, Army Research Office

5:00-6:15 Tuesday

Room 134

Tuesday 7:30-10:00

Poster Session & Conference Reception

Session Chairs: Chennupati Jagadish, Australian National University &

Paul Borrows, Pacific Northwest National Laboratory

The complete lists of posters is at the end of this technical program.

7:30-10:00 Tuesday

Room 135

Wednesday 13 August 2003

Wednesday 9:00-9:50

Plenary Talk 2 – Photonic Bandgap Based Designs for Nano-Photonic Integrated Circuits

Speaker: Eli Yablonovitch, UCLA

**Session Chairs: Paul Burrows, Pacific Northwest National Laboratory &
Leonard Bond, Pacific Northwest National Laboratory**

9:00-9:50 Wednesday

Room 134

Wednesday 10:00–12:15

WA: Molecular Electronics IV

Session Chair: Kwan Kwok, DARPA

10:00-12:15 Wednesday

Room 134

WA 1: Silicon-based Molecular Electronic Devices (Invited)

Titash Rakshit, Gengchau Liang, Supriyo Datta and Avik Ghosh

WA 2: Terahertz Electronics and Photonics: Arrays of Semiconductor Quantum Structures (Invited)

S. James Allen

WA 3: Theoretical Electromagnetic Analysis of a Grating-Gated Double Quantum Well FET Terahertz Detector

V. V. Popov, O. V. Polischuk, T. V. Teperik, N. J. M. Horing, X. G. Peralta, S. J. Allen and M. C. Wanke

WA 4: Terahertz Electromagnetic Wave Amplification by a Lateral Double-Quantum-Wire Superlattice Subject to Current-Driven Plasmon Instability

G.R. Aizin, L.G. Mourokh, V.M. Kovalev and Norman J.M. Horing

WA 5: Quantum Monte Carlo Simulation of the Single Electron Transistor Conductance

B. Gelmont, D. Woolard and R. Williams

WB: Carbon Nanotube Based Technologies I

Session Chair: Joerg Appenzeller, IBM Yorktown Heights

10:00-12:15 Wednesday

Room 133

WB 1: Carbon Nanotube Devices for Future Nanoelectronics (Invited)

S. J. Wind, J. Appenzeller, R. Martel, M. Radosavljevic, S. Heinze and Ph. Avouris

WB 2: Self-assembled Single Wall Carbon Nanotube Field Effect Transistors

Laetitia Marty, C. Naud, M. Chaumont, A.M. Bonnot, T. Fournier and V. Bouchiat

WB 3: Modeling of Carbon Nanotube Schottky Barrier Reduction for Holes in Air

Toshishige Yamada

WB 4: Electrostatics of Nanowire Transistors

Jing Guo, Jing Wang, Eric Polizzi, Supriyo Datta and Mark Lundstrom

WB 5: Surface Phenomena at Metal-Carbon Nanotube Interfaces

Quoc Ngo, Dusan Petranovic, Hans Yoong, Shoba Krishnan and Cary Y. Yang

WB 6: Carbon Nanotube Growth for GHz Devices

Shengdong Li, Zhen Yu, Goldie Gadde, Peter J. Burke and W. C. Tang

WC: Modeling and Simulation IV: Thermal Session Chair:

Session Chair: Narayan Aluru, University of Illinois, Urbana-Champagne

10:00-10:30 Wednesday

Room 132

WC 1: Theoretical Analysis of SnO₂ Nanobelt Thermal Conductivity

N. Mingo, Ch. Yu, Q. Hao and Li Shi

WC 2: Molecular Dynamics Simulation Heat Pulse Propagation In Single Wall Carbon Nanotubes

Aron Cummings, Deepak Sirivastava and Mohamed A. Osman

WCC: Modeling and Simulation V: Applications

Session Chair: K. Likharev, Stony Brook University

11:00-12:15 Wednesday

Room 132

WCC 1: Multi-scale Analysis and Design of Nano Imprint Process

Jae Hyun Kim, Jung Yup Kim, Byung Ik Choi

WCC 2: Temperature Dependence of Nanopatterning of Inhomogeneously Strained Surfaces

Mats I. Larsson, Bruce M. Clemens, Renat F. Sabiryanov and Kyeongjae Cho

WCC 3: Characteristic Mechanism of Molecular Dissociation and Nanofabrication Using Optical Near Fields

Kiyoshi Kobayashi, Tadashi Kawazoe and Motoichi Ohtsu

WD: Nano-optics, Nano-optoelectronics and Nanophotonics I

Session Chair: N. Ledentsov, Ioffe Institute and Technical University of Berlin

10:00-11:00 Wednesday

Room 131

WD 1: Photonic Bandgap Microcavity Devices (Invited)

A. Scherer, M. Loncar, T. Yoshie and K. Okamoto

WD: Nano-optics, Nano-optoelectronics and Nanophotonics I

Session Chair: Axel Scherer, California Institute of Technology

11:00-12:15 Wednesday

Room 131

WD 2: Novel Nanostructures for Light: Photonic Crystals (Invited)

Susumu Noda, Takashi Asano and Masahiro Imada

WD 3: Surface Plasmon Coupling Between Two Nano Au Particles

K. H. Su, Q. -H. Wei, X. Zhang, J. J. Mock, D. R. Smith and S. Schultz

WD 4: Functional Operations Using a Near-Field Optically Coupled Quantum-Dot System

Suguru Sangu, Kiyoshi Kobayashi, Motoichi Ohtsu and Akira Shojiguchi

WD 5: Cold-atom Output From a Near-Field Optical Funnel

Akifumi Takamizawa, Haruhiko Ito, Shungo Yamada and Motoichi Ohtsu

WE: Nanosensors and Actuators I

Session Chair: Sergey Lyshevski, RIT

10:00-12:15 Wednesday

Room 130

WE 1: Optical Detection of Nanotweezers' Actuation

Christine Meyer, Heribert Lorenz and Khaled Karrai

WE 2: Nanoactuators: Novel Synchronous Reluctance Nanomachines

Sergey Edward Lyshevski

WE 3: Sub-nanometer Stepping Drive of Surface Acoustic Wave Motor
Takashi Shigematsu, Minoru Kuribayashi Kurosawa and Katsuhiko Asai

WE 4: Integrated Optical Nanosystems with an Embedded In-Line Thermo-Optic Modulator
S. Baglio, S. Castorina, L. Fortuna, G. H. Bernstein and W. Porod

Wednesday 1:30–3:00

WF: Molecular Electronics V

Session Chair: Dwight Woolard, Army Research Office

1:30-3:00 Wednesday

Room 134

WF 1: Hybrid CMOS/Molecular Memories Using Redox-Active Self-Assembled Monolayers
Guru Mathur, Srivardhan Gowda, Qiliang Li, Shyam Surthi, Shun-ichi Tamaru, Jonathan Lindsey and Veena Misra

WF 2: Metal-Molecule-Semiconductor Heterostructures for Nano-Device Applications
Saurabh Lodha, Jaewon Choi, Sugata Bhattacharya and David B. Janes

WF 3: Coupling of Electromagnetic Waves and Bloch Oscillations in Quantum Superlattice
A. S. Raspopin, H. -L. Cui and A. A. Zharov

WF 4: Electron Transport Through a Biased Asymmetric Double-Dot System in a Parallel Arrangement
Between Leads
L. G. Mourokh, Vadim M. Kovalev, Vadim I. Puller, Norman J. M. Horing and Anatoly Y. Smirnov

WF 5: Transient Wigner Function Simulations and Dilute Magnetic Semiconductor Tunneling Devices
Harold Grubin

WF6: ab Initio Quantum Transport Study of Metal-Molecule-Metal Structures
Ping Bai, Shuowang Yang, Enfeng Liu and Erping Li

WG: Carbon Nanotube Based Technologies II

Session Chair: Joerg Appenzeller, IBM Yorktown Heights

1:30-3:00 Wednesday

Room 133

WG 1: High-Mobility Semiconducting Nanotubes for Nanoelectronics (Invited)
B. M. Kim, T. Dürkop, T. Brintlinger, E. Cobas and Michael S. Fuhrer

WG 2: Direct Integration of Single-Walled Carbon Nanotubes with Silicon
P. M. Albrecht, R. M. Farrell, W. Ye and J. W. Lyding,

WG 3: Fabrication of a Single Multi-walled Carbon Nanotube Array with a Composite Electric Field
Guided Assembly Method
Jaehyun Chung, Kyong-Hoon Lee and Junghoon Lee

WG 4: Nanoscale Soldering of Positioned Carbon Nanotubes Using Highly Conductive Electron Beam
Induced Gold Deposition
Dorte Nørgaard Madsen, Kristian Mølhave, Anne Marie Rasmussen, Charlotte Clausen Appel, Ramona
Mateiu, Peter Bøggild, Michael Brorson and Claus J. H. Jacobsen

WG 5: Stimulated Emission and Optical Gain in Single-Walled Carbon Nanotubes
Jay E. Sharping, Samuel Isaac Stupp, Prem Kumar, Mark Christopher Hersam and Michael Scott Arnold

WJ: Modeling and Simulation VI: Circuits and Systems
Session Chair: Toshi Yamada, NASA Ames Research Center
1:30-3:00 Wednesday
Room 132

- WJ 1:** Neuromorphic CMOL Circuits (Invited)
Konstantin K. Likharev
- WJ 2:** Circuit-Compatible Modeling of Carbon Nanotube FETs in the Ballistic Limit of Performance
Arijit Raychowdhury, Saibal Mukhopadhyay and Kaushik Roy
- WJ 3:** A Coupled Circuit and Device Simulator for Design of RF MEMS VCOs
Manas Behera, Sudipto De, Narayan Aluru and Kartikeya Mayaram
- WJ 4:** Accurate Modeling of Thin-Film Inductance for Nano-Chip
Jayanta Choudhury, G.H. Massiha and G. S. Seetharaman
- WJ 5:** Strategy and Prototype Tool for Doing Fault Modeling in a Nano-technology
Timothy J. Dysart and Peter M. Kogge

WK: Nano-optics, Nano-optoelectronics and Nanophotonics II
Session Chair: Yasuhiko Arakawa, Tokyo University
1:30-3:00 Wednesday
Room 131

- WK 1:** Unique Properties of Quantum Dot Lasers (Invited)
N. Ledentsov, A.R. Kovsh, D. Ouyang, A.E. Zhukov, V.M. Ustinov, M.V. Maximov, Yu.M. Shernyakov, N. V. Kryzhanovskaya, I. N. Kaiander, R. Sellin and D. Bimberg
- WK 2:** InAs Quantum Dot Lasers on InP Substrate
Yueming Qiu, David Uhl, Rebecca Chacon and Rui Q. Yang
- WK 3:** Optical Properties of a Semiconductor Nanowire Laser
Cun-Zheng Ning and Alexey V. Maslov
- WK 4:** Fabrication and Photoluminescent Properties of ZnO/ZnMgO Quantum Structure Nanorods
W. I. Park and G. -C. Yi
- WK 5:** The Blue-Green Luminescence and Current-Voltage Characteristics of MOS Diode Made on Thermally Annealed Si⁺ Implanted SiO₂ Substrate
Gong-Ru Lin and Chun-Jung Lin

WL: Nanobio Fusion I
Session Chair: Anantha Krishnan, DARPA
1:30-3:00 Wednesday
Room 130

- WL 1:** Nano-bio or Bio-nano: What's the Difference? (Invited)
Arun Majumdar
- WL 2:** Protein-based Self-Assembly Bridging System With Cassette Tags
Yang-ren Rau and Huey-jenn Chiang
- WL 3:** Hybrid Protein/Polymer Biomimetic Membranes
Dean Ho, Benjamin Chu, Jacob J. Schmidt, Evan K. Brooks and Carlo D. Montemagno
- WL 4:** Detection of Biomolecules Using In₂O₃ Nanowires
Chao Li, Daihua Zhang, Bo Lei and Chongwu Zhou
- WL 5:** Toward Development of Nano- Materials Composed of Artificial Protein and Nano-Carbon
Daisuke Kase, Kiyotaka Shiba, Jin Zhu, Daisuke Kasuya and Sumio Iijima

Wednesday 3:30–4:30

WM: Molecular Electronics VI

Session Chair: Dwight Woolard, Army Research Office

3:30-4:15 Wednesday

Room 134

WM 1: Numerical Tools for the Study of Instabilities Within the Positive-Differential-Resistance Regions of Tunneling Devices

M. S. Lasater, P. Zhao, C. T. Kelley and D.L. Woolard

WM 2: A Computer Code for Lattice Weyl-Wigner Simulations of Transport in Circular Cylindrical Nanostructures

G. Recine, B. Rosen and H.L. Cui

WM 3: Modeling Transport in Nanoscale Silicon and Molecular Devices on Parallel Machines

Sébastien Goasguen, Ramesh Venugopal and Mark S. Lundstrom

WN: Circuits and Architectures I

Session Chair: Jose Fortes, University of Florida

3:30-4:15 Wednesday

Room 133

WN 1: Models and Abstractions for Nanoelectronics (Invited)

Seth Copen Goldstein and Yaoyao Zhu

WN 2: An Architecture for Molecular Computing Using Quantum-Dot Cellular Automata

Enrique P. Blair and Craig S. Lent

WP: Nanoelectronics I

Session Chair: Paolo Lugli, Technical University of Munich

3:30-4:30 Wednesday

Room 132

WP 1: Imaging Coherent Electron Flow (Invited)

M. A. Topinka, B. J. LeRoy, A. C. Bleszynski, K. E. Aidala, S. E. J. Shaw, E. J. Heller, K. D. Maranowski, A. C. Gossard and Robert M. Westervelt

WP 2: Electronic Transport Studies and Photo-Detecting Properties of Indium Oxide Nanowires

Bo Lei, Chao Li, Daihua Zhang and Chongwu Zhou

WP 3: Ohmic and Schottky Nanocontacts on ZnO Nanorods

W. I. Park and G. -C. Yi

WQ: Nano-optics, Nano-optoelectronics and Nanophotonics III

Session Chair: S. Noda, Kyoto University

3:30-4:15 Wednesday

Room 131

WQ 1: Ultrafast Optical Signal Processing Based on Quantum-Dot Semiconductor Optical Amplifiers: Theory and Experiment (Invited)

M. Sugawara

WQ 2: Laterally Coupled InAs Quantum Dot Distributed Feedback Lasers at 1.3 μm

Yueming Qiu and Pawan Gogna

WR: Nanobio Fusion II

Session Chair: Arun Majumdar, University of California, Berkeley

3:30-4:15 Wednesday

Room 130

WR 1: Nanometer Scale Rafts Built From DNA Tiles

Koshala Sarveswaran, Paul Huber, Marya Lieberman, Chris Russo and Craig Lent

WR 2: Polymer Translocation Through a Nanopore: a Geometry Dependence Study

James O'Keeffe, Ioana Cozmuta and Viktor Stolc

WR 3: Configurable 3D Nanoscale High Aspect Ratio Pillars for Surface-Enhanced Raman Spectroscopy

Gang Logan Liu, Yang-Kyu Choi and Luke P. Lee

Wednesday 4:30-6:00

Panel Discussion on Nanotechnology Venture Opportunities

Session Chair: Meyya Meyyappan, NASA

Panel Moderator: Alex Wong, Partner, Apex Partner

Panelists: Wasiq Bokhari, President, Quantum Insight

Mike Dierks, Intel Capital

Norm Schumacher, CEO, Molecular Imprints

Joerg Sperling, Managing Director, Ridgewood Capital

4:30-6:00 Wednesday

Room 134

Wednesday 7:00-10:30

Conference Banquet

Session Chair: Meyya Meyyappan, NASA

7:00-10:30 Wednesday

Room 135

Thursday 14 August 2003

Thursday 9:00-10:30

THA: Molecular Electronics VII

Session Chair: Hong-Liang Cui, Stevens Institute of Technology

9:00-10:30 Thursday

Room 134

THA 1: Structural DNA Nanotechnology (Invited)

Nadrian C. Seeman

THA 2: Design Tools for the Fabrication of Photonic Crystals Based on DNA Junctions

Petra Sauer, Hong-Liang Cui and Nadrian C. Seeman

THA 3: Toward Large Nanostructures

Michael Norton, Aoune Barhoumi and David Neff

THA 4: Towards Single Molecule Manipulation with Dielectrophoresis Using Nanoelectrodes
Lifeng Zheng, Shengdong Li, Peter J. Burke and James P. Brody

THA 5: Molecular Nanopatterning by Electron Beam Lithography
Yuliang Wang, Wenchuang Hu, Marya Lieberman, Gary H. Bernstein and Qingling Hang

THB: Circuits and Architectures II

Session Chair: Jose Fortes, University of Florida

9:00-10:30 Thursday

Room 133

THB 1: Architecture and Analysis of a Self-Assembled 3D Array of Carbon Nanotubes and Molecular Memories

Hod Finkelstein, Peter M. Asbeck and Sadik Esener

THB 2: Performance Estimation of Molecular Crossbar Architecture Considering Capacitive and Inductive Coupling Between Interconnects

Arijit Raychowdhury and Kaushik Roy

THB 3: Single Electron Encoded Logic Memory Elements

Casper Lageweg, Sorin Cotofana and Stamatis Vassiliadis

THB 4: Memory Arrays Based on Molecular RTD Devices

Garrett S. Rose and Mircea R. Stan

THB 5: Quantum Cellular Nonlinear Networks Using Josephson Circuits

Jie Han and Pieter Jonker

THB 6: Quantum-Dot Cellular Automata Adders

Wei Wang, Konrad Walus and G. A. Jullien

THC: Nanoelectronics II

Session Chair: Jonathan Bird, Arizona State University

9:00-10:30 Thursday

Room 132

THC 1: Nanocrystal Based Electrical Devices (Invited)

Paul Alivisatos

THC 2: High-Speed Metallic Quantum-Dot Cellular Automata (Invited)

Mo Liu and Craig S. Lent

THC 3: An RF-SET Electrometer for High Speed Measurements of Quantum-dot Cellular Automata (QCA) Circuits

Alexei O. Orlov, Thomas R. Hanley, Oreste J. Lencioni, Patrick J. Fay, Gregory L. Snider and Ravi K. Kumamuru

THC 4: Recent Advances in Nanotechnology: Key Issues & Potential Problem Areas

Tarun Gupta and Ahalapitiya H. Jayatissa

THD: Nanomaterials: Synthesis and Characterization I

Session Chair: Paul Burrows, Pacific Northwest National Laboratory

9:00-10:30 Thursday

Room 131

THD 1: Synthesis and Characterization of Helical Nanowires (Invited)

Lai-Sheng Wang, Hai-Feng Zhang and Chong-Min Wang

THD 2: Nanoheteroepitaxy of GaN on a Nanopore Array Si Surface

Jianguo Liang, Soon-Ku Hong, Nikolai Kouklin, J. Roderic Beresford and Jimmy Xu

THD 3: Group-III Nitride Nanoparticles – Synthesis and Photoluminescence Studies

Birgit Schwenzer, Stacia Keller, Lars Loeffler, Ram Seshadri, Frederick F. Lange, Steven P. DenBaars and Umesh K. Mishra

THD 4: Oxygen Diffusion in Nanocrystalline CeO₂

Laxmikant Saraf, V. Shutthanandan, Chongmin Wang, Yanwen Zhang, Olga Marina and S. Thevuthasan

THD 5: Studies of Doped Nanocrystalline Diamond Films Grown by Parallel Bias-Enhanced CVD

Joel De Jesús, Brad R. Weiner, Gerardo Morell and Juan A. González

THE: Nanofabrication and Nanolithography I

Session Chair: Gary Bernstein, University of Notre Dame

9:00-10:30 Thursday

Room 130

THE 1: Nanometer-scale Selective Epitaxy of InAs Quantum Dots Via Indium Segregation

T. S. Yeoh, V. C. Elarde, R. B. Swint and E. R. Wu, J. J. Coleman

THE 2: Optimization of Optical Disk Mastering Process Using Electron Beam Recorder

C. Y. Chen, H. Y. Tsai, C. C. Su, H. H. Lin and J. T. Cheng

THE 3: Nanotechnological, Two-stage Production Processes

Lech Znamirowski and Stefan Wegrzyn

THE 4: Mechanical Aspects of Nanoimprint Patterning

Graham L.W. Cross, Warren Oliver, Barry O'Connell and John B. Pethica

THE 5: Micro/Nanofabrication of Two and Three Dimensional Structures by Two-Photon Polymerization

Xuan-Ming Duan, Hong-Bo Sun, Koshiro Kaneko, Atsushi Nakamura, Satoru Shoji and Satoshi Kawata

THE 6: An Edge-Defined Nano-Lithography Technique Suitable for Low Thermal Budget Process and 3-D Stackable Devices

Jawad Nasrullah, James B. Burr and G. Leonard Tyler

Thursday 11:00-12:00

THF: Molecular Electronics VIII

Session Chair: Hong-Liang Cui, Stevens Institute of Technology

11:00-12:00 Thursday

Room 134

THF 1: AC Response of a Short Poly(G)-Poly(C) DNA Molecular Wire

Peiji Zhao and Dwight L. Woolard

THF 2: Self-Organized Supramolecular Wires

Chung-Yu Wu, Chi-Hau Sue and Pei-Chan Chiang

THF 3: DNA Electrical Properties and Potential Nano-applications

Mingjun Zhang and Tzyh-Jong Tarn

THF 4: Sandwich Complexes of naphthalocyanine With the Rare Earth Metals

Jianzhuang Jiang

THG: Circuits and Architectures III

Session Chair: Jose Fortes, University of Florida

11:00-12:00 Thursday

Room 133

THG 1: Robust Circuit and System Design Methodologies for Nanometer-Scale Devices and Single-Electron Transistors

Alexandre Schmid and Yusuf Leblebici

THG 2: A Novel Application of Resonant Tunneling Devices in High Performance Digital Circuits

Li Ding and Pinaki Mazumder

THG 3: GP Based Transistor Sizing for Optimal Design of Nanoscale CMOS Inverter

Manisha Pattanaik, Swapna Banerjee and Bikram K. Bahinipati

THG 4: Examination and Improvement of Reading Disturb Characteristics of a Surrounded Gate STTM Memory Cell

S. Ahn, K.H. Koh, K. W. Kwon, S. J. Baek, Y. N. Hwang, G. T. Jung, H. S. Jung and K. Kim

THJ: Nanoelectronics III

Session Chair: Martin Wybourne, Dartmouth College

11:00-12:00 Thursday

Room 132

THJ 1: Microscopic Modeling of Semiconductor Nanostructures (Invited)

Aldo di Carlo

THJ 2: Ultra-Small Physical Random Number Generators Based on Si NanoDevices for Security Systems and Comparison to Other Large Physical Random Number Generators

Shin-ichi Yasuda, Ken Uchida, Tetsufumi Tanamoto, Ryuji Ohba and Shinobu Fujita

THJ 3: Challenges and Solutions for Numerical Modeling of nanoMOSFETs

G. Curatola, G. Fiori and G. Iannaccone

THK: Nanomaterials: Synthesis and Characterization II

Session Chair: Paul Burrows, Pacific Northwest National Laboratory

11:00-12:00 Thursday

Room 131

THK 1: Characterization of Nano-Meter Scale Roughness of CVD Silicon And Silicon dioxide Films for 3-D Device Integration

H. Tolga Ilhan, Jawad Nasrullah, Ivan Linscott and G. Leonard Tyler

THK 2: Self-Assembly in Well-Defined Block Copolymers as a Route to Novel Nanostructured sp² Carbon Materials

Tomasz Kowalewski

THK 3: The Mechanical Properties of Thin Polymer Films for Nanoimprinting Lithography by Nanoindentation Test

H. J. Lee, S. Hur, S. W. Han, J. H. Kim, C. -S. Oh and S. G. Ko

THK 4: Influence of Multiple Interfaces on Oxygen Ionic Conductivity in Gadolinia-Doped Single Crystal Oxide Electrolyte Multi-Layer Nano Films

S. Thevuthasan, S. Azad, O. A. Marina, V. Shutthanandan, D. E. McCready, L. Saraf, C.M. Wang, I. Lyubinetsky, C. H. F. Peden and V. Petrovsky

THL: Nanofabrication and Nanolithography II

Session Chair: Gary Bernstein, University of Notre Dame

11:00-12:00 Thursday

Room 130

THL 1: A Nanochannel Fabrication Technique Using Chemical-Mechanical Polishing (CMP) and Thermal Oxidation

Choonsup Lee, E. H. Yang, N.V. Myung and T. George

THL 2: Custom Fabrication of Freestanding and Suspended Three-Dimensional Polymer Structures

Steven A. Harfenist, Scott D. Cambron, Robert S. Keynton and Robert W. Cohn

THL 3: Nano-optical CVD and Nanophotolithography Using an Optical Near-Field Nonresonant to Electronic Transition

Tadashi Kawazoe, Kiyosi Kobayashi and Motoich Ohtsu

THL 4: Applications of Dip Pen Nanolithography (DPN™) for Nanoprinting and Nanomanufacturing

Guy dellaCioppa

Thursday 12:00-2:00 -- Luncheon Registration Required

IEEE Region 6 Awards Luncheon and IEEE-NANO Student Prize Presentation

Session Chair: Evelyn Hirt, Battelle & IEEE Region 6 Director

Plenary Talk: Nanoelectronic Scaling Tradeoffs: What does Physics Have to Say?

**Plenary Speaker: Ralph Cavin, Vice President for Research Operations,
Semiconductor Research Corporation (SRC)**

12:00-2:00 Thursday

Room 135

Thursday 2:00-3:30

THM: Post-deadline Session

Session Chair: Meyya Meyyappan, NASA Ames Research Center and Chennupati Jagadish, Australian National University

2:00-3:30 Thursday

Room 133

THM1: Carbon nanotube for nanoelectronics

W.B. Choi, Samsung Advanced Institute of Technology(Korea) and Florida
International University, USA

THM 2: DNAzyme directed assembly of gold nanoparticles as calorimetric sensors for a broad range of analysis

Yi Lu, University of Illinois at Urbana-Champaign, USA

THM 3: Directed protein orientation by site specific labeling

Dean Ho, University of California -Los Angeles, USA

THM 4: Nano-imprint technology for fabrication of transducers – redox reactions at the nanoscale

P. Carlberg, Lund University, Sweden

THM 5: Polarization selectivity of light through elliptical nano-hole arrays in a metal

R. Gordon, University of Victoria, Canada

THM 6: Self-organized luminescent nanostructures on silicon wafers

K. Prabhakaran, NTT Basic Research Labs (Japan) and Stanford University, USA

THP: Nanoelectronics IV

Session Chair: Chongwu Zhou, USC

2:00-3:15 Thursday

Room 132

THP 1: Transistor With Electrically Induced Quantum Wire Channel

S. J. Baik, Siyoung Choi, U-In Chung and Joo Tae Moon

THP 2: SOI-based Single-Electron Transistor of THz Ultra-Fast Intrinsic Speed and Its Applications to Complementary Logic Cells and SET/FET Hybrid Integrated Circuits

Jung Bum Choi

THP 3: Background Charge Insensitive Single-Electron Memory Devices

Kameshwar K. Yadavalli, Alexei O. Orlov, Gregory L. Snider and Alexander N. Korotkov

THP 4: Single-Electron Transistor Using Self-Aligned Sidewall Spacer Gates on Silicon-on-Insulator Nanowire

S. F. Hu, Y. C. Wu, C. L. Sung, C. Y. Chang and T. Y. Huang

THP 5: Nanoscale Polymer Field-Effect Transistors

Liang Wang, Taeho Jung, Daniel Fine, Saiful I. Khondaker, Zhen Yao, Heinz von Seggern and Ananth Dodabalapur

THQ: Nanomaterials: Synthesis and Characterization III
Session Chair: Paul Burrows, Pacific Northwest National Laboratory
2:00-3:30 Thursday
Room 131

THQ 1: Room-Temperature Local Synthesis of Carbon Nanotubes
Dane Christensen, Ongi Englander, Jongbaeg Kim and Liwei Lin

THQ 2: Effect of Pregrowth Catalyst Nanoparticles on the Formation of Carbon Nanotubes
Meming Huang, Di Wu, Katharine Dovidenko, Bingqing Wei, Robert Vajtai, Pulickel M. Ajayan and Ananta Raj Adhikari

THQ 3: Observation of an Optical Near-Field Energy Transfer in Closely Spaced ZnO/ZnMgO Multiple-Quantum-Well Nanorods for Nanophotonic Devices
T. Yatsui, J. Lim, T. Kawazoe, K. Kobayashi, M. Ohtsu, W. I. Park and G. -C. Yi

THQ 4: Silver-tetracyanoquinodimethane (Ag-TCNQ) Nanostructures and Nanodevice
Zhiyong Fan, Dawei Wang, Jia Grace Lu, Xiaoliang Mo, Chengfei Lou, Yan Yao and Guorong Chen

THQ 5: Laser Ablation Synthesis of Oxide Nanowires and Their Properties
Zuqin Liu, Daihua Zhang, Chao Li and Chongwu Zhou

THR: Nanofabrication and Nanolithography III
Session Chair: Gary Bernstein, University of Notre Dame
2:00-3:30 Thursday
Room 130

THR 1: A Single-Domain 26nm-Pitch Pattern for the X-Y Quantum Dot Media Template
Masatoshi Sakurai

THR 2: Controlled Fabrication of Electrodes With a Few Nanometer Spacing by Selective Etching of a GaAs/AlGaAs Heterostructure
J. Kim, L. A. Farina, K. M. Lewis, X. Bai, Ç. Kurdak, M. Reason and R. S. Goldman

THR 3: Low Temperature Development of PMMA for Sub-10-nm Electron Beam Lithography
Wenchuang Hu, Gary H. Bernstein, Koshala Sarveswaran and Marya Lieberman

THR 4: Calligraphy on Self-assembled Monolayer of Supramolecules
Dongmin Wu, Xiaobo Yin, Xiang Zhang, Hsian-Rong Tseng and J. Fraser Stoddart

THR 5: Subwavelength Nanolithography Using Surface Plasmons
W. Srituravanich, N. Fang, C. Sun, Q. Luo and X. Zhang

Poster Session (Tuesday 12 August 2003)

PA: Carbon Nanotube Based Technologies

PA 1: GHz Carbon Nanotube Resonator Bio-Sensors

K. Aihara, J. Xiang, S. Chopra, A. Pham and R. Apprao

PA 2: A Comparison of PM3 Semiempirical and B3LYP Density Functional Methods for Calculating Carbon Nanotube – Hydrocarbon Bond Strengths

Kim Bolton, Simon Gustavsson and A. Rosen

PA 3: Photoconductivity of Single-wall Carbon Nanotubes under CW Illumination

I. A. Levitsky, P. T. Kanelos and W. B. Euler

PA 4: Creation of 1-D Novel Structure Inside Single-walled Carbon Nanotubes Using Plasma Ion Irradiation Method

Rikizo Hatakeyama, G. -H. Jeong and T. Hirata

PA 5: Supercurrents Through Diffusive Multi-walled Carbon Nanotubes

J. Haruyama, S. Miyadai, K. Takazawa, A. Takeda, N. Hori, I. Takesue, T. Akazaki and H. Takayanagi

PA 6: Purification of Single-wall Carbon Nanotubes (SWNTs) and the Preparation of High Quality SWNT/Silicon Surfaces

Peter M. Albrecht, Wei Ye, Joseph W. Lyding and Robert Michael Farrell

PA 7: Theory of Nanotube Opto-Electromechanical Device

Slava V. Rotkin

PA 8: High-Q Mechanical Resonator Arrays Based on Carbon Nanotubes

John F. Davis, Mike Bronikowski, Dan Choi, Larry Epp, Michael Hoenk, Dan Hoppe, Bob Kowalczyk, Flavio Noca, Eric Wong, Brian Hunt, J. Douglas Adam and Robert M. Young, B. Chang, M. Jouzi, M. Tzolov, A. Yin, J. Xu, Jesse Adams and Ben Rogers

PB: Circuits and Architectures

PB 1: A Robust Design for Fully-Silicided Electrostatic Discharge Protection Devices in Sub-100 nm CMOS Circuit Era

Jam-Wem Lee and Yiming Li

PB 2: Neural Network Synapse Device Using Single-Electron Tunnel Junctions

Mincheol Shin

PB 3: A Modular Approach for Reliable Nanoelectronic and Very-Deep Submicron Circuit Design Based on Analog Neural Network Principles

Alexandre Schmid and Yusuf Leblebici

PB 4: Modified Karnaugh Map for Quantum Boolean Circuit Consideration

Shiou-An Wang, Chin-Yung Lu, I-Ming Tsai and Sy-Yen Kuo

PB 5: Nanotechnology and Super-High Density Three-Dimensional Nanoelectronics and NanoICs

Sergey Edward Lyshevski

PB 6: Information-Theoretical Synthesis of Nanocomputers

Lydia Lyshevski

PC: Inorganic Nanowires, Nanocrystals and Quantum Dots

PC 1: Picosecond Time-Resolved Bleaching Dynamics of Self-Assembled Quantum Dots

E. W. Bogaart, J. E. M. Haverkort, T. Mano, R. Notzel, J. H. Wolter, P. Lever, H. H. Tan and C. Jagadish

PC 2: Formation of Self-Assembled Cuprous Oxide Nano-Dots on SrTiO₃(100) Surfaces

Donald R. Baer, I. Lyubnitsky, S. Thevuthasan, D. E. McCready and A. S. Lea

PC 3: Evaluation of Size and Distribution of InP Nanowires Using Small Angle X-Ray Scattering and X-ray Diffraction at the Grazing Condition

Tomoaki Kawamura, Satyaban Bhunia, Yoshio Watanabe, Seiji Fujikawa, Kenshi Tokushima, Junji Matsui, Yasushi Kagoshima and Yoshiyuki Tsusaka

PD: Modeling and Simulation

PD 1: A New Design Technique of Hybrid SET/CMOS Static Memory Cells

Bong Hoon Lee and Yoon-Ha Jeong

PD 2: Simulation Study of Hydrogen Storage in Two Kinds of Y-junction Carbon Nanotubes

Hongli Wu, Jieshan Qiu, Ce Hao and Yongfeng Li

PD 3: Computational Study of the Non-Equilibrium Flow of Gases Through Carbon Nanotubes

Ki Ho Lee and Susan B. Sinnott

PD 4: Tuning of the Transmission Resonance in Aharonov-Bohm Quantum Ring

Yong S. Joe, Aphrodite Ahmadi and Ronald M. Cosby

PD 5: Border States in Type III Heterojunctions

Nikita S. Averkiev, Robert V. Parfen'ev and Konstantin Romanov

PD 6: Molecular Dynamics and Kinetic Monte Carlo Simulation of Nano-scale Device Process

Jaesik Oh

PD 7: Nanoaerosol Cool Plasma for Accumulating of Electric Power

Yurii Kopytin and Oleg Novikov

PD 8: A Quantum Memory on Magnetic Knot Qubits

Dimitri O. Ledenyov, Oleg P. Ledenyov and Viktor Olegovich Ledenyov

PD 9: Modeling, Simulation, Control and Optimization Paradigms for *E.coli* Bacteria

Sergey Edward Lyshevski

PD 10: High-Fidelity Modeling, Heterogeneous Simulation and Optimization of Synchronous Nanomachines and Motion Nanodevices

Sergey Edward Lyshevski

PE: Molecular Electronics

PE 1: *In situ* Infrared Spectroscopic Studies of Molecular Behavior in Nanoelectronic Devices

Tony Jun Huang, Amar Flood, Chih-Wei Chu, Seogshin Kang, Tzung-Fang Guo, Tohru Yamamoto, Hsian-Rong Tseng, Bi-Dan Yu, Yang Yang, J. Fraser Stoddart and Chih-Ming Ho

PE 2: A Microscopic Quantum Model of Nanoscale Ballistic Rectifiers

Bing Dong and H. L. Cui

PE 3: Computer Numerical Analysis of Electrokinetic Injection in Chip Capillary Electrophoresis

Yan Weiping, Zheng Jiuwen, Wang Jing, Liu Chong and Bai Jiling

PE 4: Investigation of Interface Effect of Nanoscale Devices

Enfeng Liu, Ping Bai and Erping Li

PE 5: A Two-Dimensional Numerical Simulation of a Cylindrical Resonant Tunneling Structure Using a Parallelized Two-Dimensional Lattice Weyl-Wigner Transport Computer Code

Bernard Rosen, Hong-Liang Cui and Greg Recine

PE 6: A Defect-Tolerant Memory Architecture for Molecular Electronics

Myung-Hyun Lee, Young Kwan Kim and YoonHwa Choi

PE 7: A Numerical Study of Various Asymmetric Quantum Well Structures

Greg Recine, B. Rosen and H.L. Cui

PE 8: Temperature Dependence of Conductance of a Tunnel Junction Coupled to a Nanomechanical Oscillator

Anatoly Yu. Smirnov, Lev G. Mourokh and Norman J. M. Horing

PE 9: Quantum Transport in Staggered Bandgap Resonant Tunneling Heterostructures

Hong-Liang Cui and Mehmet Burcin Unlu

PF: Nano-bio Fusion

PF 1: Microsphere Dynamics for Actin Based Nanorobotic Motility

Jinsoo Yi, Sergio Freire, David Wendell, Jacob Schmidt, Herc Nerves and Carlo Montemagno

PF 2: Superimposed AC- and DC- Electric Field Guided Deposition of a Single DNA Molecule Along a Microfabricated Gap

Kyong-Hoon Lee, Jaehyun Chung and Junghoon Lee

PF 3: Reconstitution of Energy Converting Proteins in Biocompatible Materials

Hyeseung Lee, Dean Ho, Jacob Schmidt and Carlo Montemagno

PF 4: Dielectric Spectroscopy of Nano-Structured Bio-Interface: Cell/Surface Interaction

Paul Takhistov

PG: Nanoelectronics

PG 1: Novel Electrostatic Discharge Protection Design for Nanoelectronics in Nanoscale CMOS Technology

Ming-Dou Ker and Tang-Kui Tseng

PG 2: Nonvolatile Quantum Dot Memory (NVQDM) in Floating Gate Configuration: Device and Circuit Modeling

El-Sayed Hasaneen, A. Rodriguez, B. Yarlagadda, F. Jain, E. Heller, W. Huang, J. Lee and F. Papadimitrakopoulos

PG 3: SET/CMOS Universal Literal Gate-based Analog-to-Digital Converter

Myung-Jo Chun and Yoon-Ha Jeong

PG 4: Nanocomposite Spun Films Based Upon Lead Phthalocyanine

A. V. Nabok, A. K. Ray, Iwantono, M.J. Cook, P.M. Burnham and H. Yanuar

PG 5: Analysis of Carbon Nanotube Intramolecular p-n Tunnel Junction Transistors

W. H. Richardson

PG 6: Quantum Electrical Characteristics of Nanocapacitors

S. R. Ekanayake, B. S. Rodanski, M. B. Cortie and M. J. Ford

PG 7: Two-Terminal Si-nanocrystal Memory Formed Between the Two Metal Layers

Shinobu Fujita, Shin-ichi Yasuda, Keiko Abe and Naoharu Sugiyama

PG 8: A New Photo-Sensing Nano-Device Structure With CdSe and Au Nanoparticles on Silicon Substrate

Chung-Yu Wu, Yaw-Kuen Li and Chang-Ching Tu

PG 9: Electron Transport in Parallel Interacting Artificial Molecules

Ronald M. Cosby, James A. Hoffmann and Yong S. Joe

PG 10: 3-Dimensional Configuration to Promote Timely Settling of Quantum-dot Cellular Automata

Jie Liang and John C. Lusth

PG 11: Influence of Dot Size and Density on the Program Characteristics of Nanocrystal Flash Memories

Giuseppe Iannaccone

PH: Nanofabrication and Nanolithography

- PH 1:** Coulomb Blockade Systems Fabricated by Atomic Force Microscopy
Quoc Thai Do, Hans Clemens and Axel Lorke
- PH 2:** Fabrication of Fully Released Aluminum Nitride Nanoresonators
L. J. Currano, A.E. Wickenden and M. Dubey
- PH 3:** Advances in Current Controlled Scanning Probe Lithography
Ben Rogers and David York
- PH 4:** Ordered Three Dimensional Structures Using Standing Ultrasonic Waves
V S Stenkamp, T S Zemanian, M D Flake, S K Sundaram, P D Panetta and Leonard John Bond
- PH 5:** Measurements of Electrical Conductivity of a Nanometer-Scale Water Meniscus by Atomic Force Microscopy
Cristina Martin, Francesc Pérez Murano and John A. Dagata
- PH 6:** Patterning of Si₃N₄ and TiN Film With Scanning Probe Lithography
F. S. -S. Chien, Y. -C. You, B. C. Yoa, J. -L. Hsieh, D. -Y. Lai, C. -S. Lai and D. Jeng
- PH 7:** Lateral Ordering of Microfabricated SiO₂ Nanotips
James Young, Scott Lea, Suntharampillai Thevuthasan, Glen Dunham, Jay W. Grate, Donald R. Baer and Laxmikant V. Saraf
- PH 8:** Demonstration of Nano-Structures Using Wedge-Molding Process
Wei Wei, Larry L. Yang, Mark Bachman and Guann-Pyng Li
- PH 9:** Nanorheology of Squeezed Polymer Films
Barry O'Connell, Graham L. Cross, John B. Pethica and Warren Oliver
- PH 10:** The Overview of Scanning Probe Lithography by Electron Beam Exposure of Organic Resists
L. B. Zhang, J. X. Shi, J. L. Yuan, M. Chang and X. H. Wang
- PH 11:** Preparation of Porous Filament Via Electrospinning
Hak Yong Kim, Myung Seob Khil, Hyung Jun Kim, Yoon Ho Jung and Douk Rae Lee
- PH 12:** Technology and Complete Set of the Equipment for Metal Oxides Nanopowders Synthesis by Air-Plasma Method
Oleg Novikov and Yurii Kopytin
- PH 13:** Study of Fabricating Functional Nanostructure Through Combined With Molecular Assembly
Ning Gu, Lan Huang, Li-na Xu, Jian-hui Liao, Yu Zhang, Meng Wang, Kai-chang Zhou, Jing Wang, Cun-wang Ge, Wei Yu, Hao-ying Shen and Li Peng
- PH 14:** Pattern of Polymer Nanofibers Via Electrospinning
Hak Yong Kim, Keun Hyung Lee, Kwan Woo Kim, Bong Seok Lee and Chul Ki Kim
- PH 15:** Electron-Beam-Induced Deposition of Conductive Nanostructures with Carbon Nanotube Emitters
Fumihito Arai, Pou Liu, Lixin Dong, Masahiro Nakajima and Toshio Fukuda

PJ: Nanomaterials: Synthesis and Characterization

- PJ 1:** Growth of GaN Nanowires on Si Substrate Using Ni Catalyst in Vertical Chemical Vapor Deposition Reactor
T. Y. Kim, S. H. Lee, Y. H. Mo, K. S. Nahm, H. W. Shim, E. -K. Suh, S. H. Lee and G. S. Park
- PJ 2:** Anomalous Growth of Carbon-Coated Nickel Silicide Nanowires
K. S. Kee, Y. H. Mo, H. K. S. Nahm, W. Shim, E. K. Suh, S. H. Lee, S. G. Yu and G. S. Park
- PJ 3:** Catalytic Growth and Characterization of ZnO Nano-Needles
T. Y. Kim, S. H. Lee, K. Nahm, J. Y. Kim, H. W. Shim, E. K. Suh and S. H. Lee
- PJ 4:** Synthesis of High-Quality Single-Walled Carbon Nanotubes by Catalytic Decomposition of C₂H₂
Seung Chul Lyu, Bao Chun Liu, Tae Jae Lee, Cheol Woong Yang, Chong Yun Park, Cheol Jin Lee, Sang Kyu Choi and Hee Kwang Kang

PJ 5: Synthesis and Characterization of High-Quality Double-Walled Carbon Nanotubes by Catalytic Decomposition of Alcohol

Seung Chul Lyu, Bao Chun Liu, Tae Jae Lee, Cheol Jin Lee, Su Hwan Lee and Seung Il Jung

PJ 6: Nanostructured Plasma Polymer Coatings on Novel Silica Structures

Hrishikesh Manian, W. J. vanOoij and V. V. Gulians

PJ 7: Dynamic p-p Stacked Molecular Nanostructures Emit From Green and Red Color

Li-Qiong Wang

PK: Nano-optics, Nano-optoelectronics and Nano-photonics

PK 1: Nanofabrication of Sub-Wavelength Size Aperture Array for Near Field Optical Probe Array

J.T. Ok, S. S. Choi, D.W. Kim, C.K. Chun, J.W. Kim and J.H. Boo

PK 2: Reflection Characteristics of Nanoscopic Layered Structures and Optical Diagnostics of Ultrathin Dielectric Films

P. Adamson

PK 3: Nano- and Microoptoelectromechanical Systems and Nanoscale Active Optics

Sergey Edward Lyshevski and Marina Alexandra Lyshevski

PK 4: Synthesis and Photonic Applications of Gallium Nitride Nanowires

S. Han, Wu Jin, Tao Tang and C. Zhou

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P. Lever, K. Stewart, L. Fu, H. H. Tan and C. Jagadish

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PL: Nanorobotics: Manufacturing and Reliability

PL 1: Fabrication of Gecko Foot-Hair Like Nano Structures and Adhesion to Random Rough Surfaces

Domenico Campolo, Steven Jones and Ronald S. Fearing

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Slawomir Nowak and Stefan Wegrzyn

PL 3: Biological Investigation Using Scanning Probe Recognition Microscopy

Qian Chen, Virginia Ayres and Lalita Udpa

PL 4: Towards Batch Fabrication of Bundled Carbon Nanotube Thermal Sensors

Carmen K. M. Fung, Victor T. S. Wong and Wen J. Li

PM: Nanosensors and Actuators

PM 1: Chemical Gas Sensors Using Carbon Nanotubes Grown on Microstructure

Yoon-Taek Jang, Soo-Won Kim, Yun-Hi Lee, Byeong-Kwon Ju and Seung-Il Moon

PM 2: Application of Nanoelectrodes in Recording Biopotentials

A. George Akingba, David Wang, Peng-Sheng Chen, Hercules Neves and Carlo Montemagno

PM 3: Synthesis and Analysis of Induction Nanomachines

Sergey Edward Lyshevski

PM 4: Silicon Nanowire-Based Nanoactuator

Maggie Chau, Ongi Englander and Liwei Lin

PM 5: MOS Junction Based Nanostructures by Thermal Oxidation of Silicon Wires for Hydrogen Detection

A. Tibuzzi, M. Decarli, G. Soncini, C. Di Natale, A. D'Amico, B. Margesin and M. Zen

PN: Spintronics and Nanomagnetism

PN 1: On-chip Detection of Antibody-Ligand Binding and Release Using Spin Valve Sensors and Nanometer-Sized Magnetic Labels

Hugo A. Ferreira, Paulo P. Freitas, Joaquim M. S. Cabral and Daniel L. Graham

PN 2: Electron Energy State Spin-Splitting in Nanoscale InAs/GaAs Semiconductor Quantum Dots and Rings

Yiming Li and Hsiao-Mei Lu

PN 3: Matrix Model of Spin Transistor

M. Afzal Kamboh, B. S. Chowdhry and A.Q. Khan Rajput

PQ: Systems Integration

PQ 1: Using Conductive AFM of Ionic Conductivity for Microfluidic Device Characterization

Karen Cheung, Ratneshwar Lal, Luke P. Lee and Cristian Ionescu-Zanetti

PQ 2: Optical Diversity by Nanoscale Actuation

Wei-Chuan Shih, Carlos Hidrovo, Sang-Gook Kim and George Barbastathis

PQ 3: Nanoengineering Bioinformatics: Nanotechnology Paradigm and Its Applications

Sergey Edward Lyshevski, Frank A. Krueger and Elias Theodorou

PQ 4: Impact of the Casimir Force on Movable-Dielectric RF MEMS Varactors

Hector J. De Los Santos